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Timex Sinclair User Group NEWSLETTER

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Ottawa Chapter

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President's Address

The BASIC course finally got underway and the first lecture dealt with a few definitions and then launched right in with some of the control instructions. Lectures will be given at each meeting following completion of regular club business and will last for approximately one hour. The text for the course is "The Essential Guide to TIMEX/Sinclair Home Computers" ISBN 0-671-47069-8 Pbk. ans sells for approximately $12. Dave Solly has order a few copies for the club library. Anyone interested giving a lecture or two, please contact me.

I reported in the previous newsletter that Sir Clive was on the threshold of receivership. I am pleased to report that new arrangements have been made with his creditors and Sinclair will continue in business. By way of interest the price of the QL has fallen to £199.

I notice that presentations at the club meetings have ceased. You will recall that a roster was set up (See Vol. 2, Issue 2 of the Newsletter) for presentations. I stand to be corrected but I think Bob Hewens is next in line.

At the October meeting it was agreed that we would increase the number of subscriptions to newsletters and magazines. Dave Solly was authorized to procure up to an additional $150 worth of new subscriptions.

To increase membership, it was agreed at the previous meeting to place an ad in the "Computers for Sale" section of the Citizen informing readers of the time and place of our next meeting. Members are also encouraged to seek new members.

With the end of the year rapidly approaching, the time has come for the election of a new slate of officers. As I stated at the October meeting, it is time for new blood to take over the reins of the club to ensure that the club will continue to grow and enrich the membership. For most of us the status quo will do quite nicely however, we need new ideas and enthusiastic leadership to maintain vitality in the club otherwise the club will stagnate. Be prepared to offer your name for one of the positions on the executive. To ensure that new blood is brought to the executive, neither I nor most of the current slate of officers will offer our names for re-election. It goes without saying that we will continue to actively participate in the affairs of the club.

JOHN OLIGER 2068 CENTRONICS INTERFACE

I bought a Centronics interface kit from John Oliger the other day and after a couple of hours it was up and running as advertized. You need an Expansion board to plug in the interface which I obtained earlier from Oliger. Although the board is only about 2" high, it still made it difficult to access the LARKIN Disc Drive slot at the rear of my computer so I had to re-package the drive and now use one of the Expansion board slots to interface to the computer. I highly recommend this Centronics Interface card. It contains only four chips (with sockets), is easy to assemble, it's inexpensive and is professional in appearance.

CITOh PRINTER

I bought a CITOh Prowriter Jr. from Dalburg Peripherals in Nepean last month for $299 Canadian. This unit is listed at $299 US in many US magazines which converts to $450 Canadian at today's current exchange rate. You may recall, the printer was evaluated in September issue of PC and was the Editor's choice for that price range.

After putting together an interface cable, I plugged it into the Oliger Centronics Interface Card, entered the printer driver software and lo and behold it worked.

The printer supports both traction and friction-fed paper and comes complete with legs (somewhat spindly) to facilitate locating fan-fold paper under the printer so as not to increase the footprint required for the printer. The printer is fully Epson compatible. It supports a proportional print mode as well as a Near-Letter-Quality mode. The latter is a very slow 13 cps but the print quality is very good.

From the EDITOR

Well, the second year has now come and gone for the Newsletter and the possibilities of change are in the air.
Elections for the Executive are now at hand and as stated in the previous elections of last year, the executive may only remain for a term of upto two years.
Up for grabs are:
President
Administrative Director
The other positions for software and hardware directors, as well as the treasurer, have only been occupied for one year each and therefore can be vacated this year only if the incumbant so wishes. To my knowledge, both directors are indeed vacating those positions due to varying personal reasons.
I beleive that recognition of the efforts and dedication by each of the respective incumbants is most definately warranted. It is now up to the membership at large to nominate and vote in a new Executive. Naturally, the outgoing execs. will endevour to assist the new reps in ensuring a smooth transition.
In as far as the Newsletter is concerned, the matter may not be as easily resolved. A newsletter is, for this group, an essential and important part of it's existance. However, it is a function that requires some dedication, knowledge of the subject at hand, and a great deal of support. Such support, I am sad to say, has not to this date been sufficiently evident.
At this time, I am at a loss as to whether to attempt to continue, putting the position up for grabs, or stopping publication entirely. I believe that there are a number of individuals within the group that may be able to pull it off if they were to receive the appropriate support, but I am not sure that they would want the long and tedious job in the first place, or if they would be able to obtain the info to keep it going.
In this regard, if anyone is of the opinion that he/she would like to give it a go, please let me know as soon as possible so that I can arrange to talk to them . I will then explain all of the intricate functions involved.
So, let's see your support and personal dedication in the upcoming elections! Survival is of the fitest. Are you fit?

THE EDITOR,
R. MULDER
19/11/85

GENERAL

PARTIAL PASCAL
A BACKUP PROCEDURE

PARTIAL PASCAL for the ZX81 turns out to be a surprisingly good package. It is necessary, however, to read the instructions carefully and experiment for some time before making a serious evaluation of the package. The following paragraph summarises my comments on PARTIAL PASCAL.

1. To make a good use of the package, complete familiarity with the necessary screen entries is required due to the rather incomplete prompts to guide the user.
2. As far as I was able to determine, a compiled program must be saved on tape and then reloaded in order to be executed. I would prefer the convenience of running a program from memory thru a "RUN" command.
3. The keyboard decode routines are somewhat slow. Keys must be held down for a noticeably long period of time before anything registers on the screen. That makes speed entry impossible for those who have regular keyboards.
4. Integer only.
5. Files handled by PARTIAL PASCAL are saved/loaded at ZX81 speed (about 300 bauds). I am used to about 1200 bauds with QUICKTAPE.
6. It is not obvious where the source and object files are held in memory. This information is required for further studies on the object files properties (are they relocatable, can they run independently of PARTIAL PASCAL, etc...).

PARTIAL PASCAL AND QUICKTAPE

A backup copy of the package can be made by saving, from PARTIAL PASCAL itself, the complete 16K - 32k memory block. A special loader program is then required to set the stack pointer to the correct location, prior to the actual load of PARTIAL PASCAL.

The backup copy will load faster and occupy less tape space if a fast loader/saver is invoked. In this exercise, QUICKTAPE is used.

THE BACKUP PROCEDURE

Load the PARTIAL PASCAL in the regular manner. Enter the following PASCAL program that will give us information about the stack pointer location.

```
PROGRAM STACK(INPUT,OUTPUT);
VAR VALUE:INTEGER;
BEGIN
  MEM(.16446.):=237;
  MEM(.16447.):=115;
  MEM(.16448.):=60;
  MEM(.16449.):=64;
  MEM(.16450.):=237;
  MEM(.16451.):=75;
  MEM(.16452.):=60;
  MEM(.16453.):=64;
  MEM(.16454.):=201;
  VALUE:=USR(16446,0,0,0,0);
  WRITELN'"STACK IS ",VALUE);
END.
```

After execution, the result is:

"STACK IS 32686"

This indicated stack entry points to the routine at 16446. Thus, the previous stack entry - at 32688 - should point at the return address to PARTIAL PASCAL. This information will be required later or when a small loader program is prepared,thru which the backup copy of PARTIAL PASCAL will be loaded.

Another PASCAL program is required to actually save the PARTIAL PASCAL to tape from within PARTIAL PASCAL itself. Overwrite the previous PASCAL program with the following:

```
PROGRAM SAVE(INPUT,OUTPUT);
VAR VALUE:INTEGER;
BEGIN
  MEM(.16404.):=0;
  MEM(.16405.):=128;
  VALUE:=USR (8192,0,0,0,0);
END.
```

This program will set E-LINE to 32768 and then call the QUICKTAPE save routine. Thus the complete 16K - 32K memory block will be saved to tape. This is done in

order to capture the stack information residing just below RAMTOP.

The backup PARTIAL PASCAL just saved will crash if loaded directly unless the stack pointer is properly set prior to the loading. To acheive this, load the backup PARTIAL PASCAL with the following BASIC loader:

```
10 REM XXXXXXXXXX
11 POKE 16514,49
12 POKE 16515,176
13 POKE 16516,127
14 POKE 16517,205
15 POKE 16518,13
16 POKE 16519,32
17 POKE 16520,201
18 FOR I = 1 TO 22
19 SCROLL
20 NEXT I
30 RAND USR 8192
40 RAND USR 16514
50 STOP
```

To save this loader on tape, just enter <RUN>. After saving itself, this loader will automatically wait for PARTIAL PASCAL. Play the tape file previously saved thru the PASCAL SAVE program above, and PARTIAL PASCAL will load into memory from the copy and will autorun.

It is a simple matter now to prepare a backup tape of PARTIAL PASCAL with the above small BASIC loader followed by a backup copy from the SAVE program described above.

Marcel G boult

LISTS part 2

Last issue I promised some hints and fixes for the excellent "LISTS" filer program for the ZX 81 listed in the personals section.

I had keyed this program in myself a couple of years ago and found it to be usefull and well written. However, there is nothing so good that it can not be improved.

After entering and debugging the program, I ran a few tests with different sizes and numbers of files. I discoverd that if one responds to the question "How many files do you want?" in the "set up list" section, with the maximum shown, the program stops with an "OUT OF MEMORY" message. Keep this in mind and always respond to the question with a slightly smaller number. Also, dont't specify more files than you really need. This is one of those programs that saves the whole list even if there is only one entry in it. An artificially large list could lengthen your loading and saving time needlessly.

I also found that if the number entered came close to filling the memory, some very strange things happened. For one, the CLS command (notoriously slow anyway) would slow down to a point where it could take almost a minute to clear the screen. Also, a simple "PRINT" something to the screen command, which would usualy just zip it up there, would print only about one character a second. (that's about 30 seconds to print one line).

After some experimentation, I figured out that the real culprit was the SCROLL command. Don't ask me why but after the first SCROLL command in the program is executed, these wierd things start to happen.

I wrote a small machine code scroll of my own that fits in a REM statement. (see listing). Just follow the instructions and you should have no problems.

Another thing I found, and this is just personal preferance on my part, is that all the choices are made with INPUT statements. That means a minimum of 2 keystokes. Many of the responses are single letter and can be handeled nicely with INKEY$. Fiddle with it a bit and see what I mean.

Of course, the program will run on the 2068 minus the SCROLL and FAST/SLOW commands but, with a little work, can be very much enhanced.

I hope these suggestions are of use to you.

Jim Turner

P.S.

There is a copy of my ZX81 version in our club library as well as a much enhanced 2068 version.

LISTING FOR MC SCROLL

```
1 REM (at least 50 spaces)
2 FOR X = 16514 TO 16563
3 INPUT A
4 POKE X,A
5 NEXT X
6 STOP
```

RUN and Enter the folowing numbers:

--> 42 12 64 84 93 1 33 0 42 12 64 9 1 181 2 237 176 42 12 64 1 182 2 9 84 93 62 0 119 19 1 33 0 237 176 1 214 2 42 12 64 62 118 9 119 1 21 0 201.

Now delete lines 2 through 6.

Enter these lines:

```
2 LET SC=5
3 GOTO 10
5 RAND USR 16514
6 RETURN
```

Now go through the listing and change every occurance of "SCROLL" to "GOSUB SC". That should take care of the slowing down problem.

SAMPLE INKEY$ ROUTINE

```
7 LET Z$= INKEY$
8 IF Z$="" THEN GOTO 7
9 RETURN
```

Now change all occurances of INPUT Z$ (or whatever) to: GOSUB 7: Do the usual checks on Z$ and you won't have to press ENTER after a simple "yes" or "no" type question.

OUT OF THE WOODWORK

by: Harry Rosewarne

To use our Editor's words, I thought I would see if I could come out of the "woodwork" and try my hand at writing an article for the Newsletter. Frankly though, I have been intimidated by the abilities of the contributing members in their understanding of the Sinclair and the sophistication of the programs written and demonstrated. However, I do sense that there are a number of members who shy away from actually writing a program thereby missing a great deal of fun and significantly reducing the usefulness of the machine.

With a litte practice, a program can quickly and easily be written to perform your personal calculations be they to determine the alcohol content of your latest home made wine or the resultsof your mortgage payments. Usually it will be quicker to sit down and write a program to do just that

than to hunt for one already written, learn how to run it and then adapt it to your specific needs. This is particularily true if you keep if you keep it simple anddon't try to be too sophisticated.

To illustrate the point, I wanted to find out how my mortgage payments were divided between interest and principal. I was surprised to find that a 37 statement program that included several REM statements , and instructions was all that was needed to produce a program that did the job and was quite user friendly. The program is easy to run; simply LOAD"" and RUN. The prompts ask for the input data of initial principal, interest rate and monthly payment in the correct order.

The computer then goes into FAST mode and calculates a table for the year giving the interest paid, mortgage repayment and the principal balance at the end of each month throughout the year. By pressing the CONT key, the next year's table is calculated and displayed. This can be changed from time to time as the mortgage conditions change.

The program is very simple, however, its sophistication can be increased by adding subroutines to:

a) align the decimal points and round to the nearest cent
b) calculate the number of payments to retire the mortgage
c) alter input data interactively
d) include a menu
e) include any other neat features that you might think of.

The program for the ZX-81 version is as follows:

```
10 REM MORTGAGE CALCULATIONS
11 REM PROGRAM BY H.P.
ROSEWARNE
12 REM LOAD MORTGAGE CALC
15 SLOW
20 PRINT" PRINCIPAL=";
30 INPUT P
40 PRINT P
50 PRINT" INT RATE=";
60 INPUT IR
70 PRINT IR
72 LET F=(1+.5*IR/100) **
.66666-1
74 PRINT" F= ";F
80 PRINT" MONTHLY PAYMENT=";
90 INPUT MP
91 PRINT MP
92 FOR Y=1 TO 25
93 FAST
94 PRINT AT 0,0;"PRINCIPAL= ";
95 PRINT"INT RATE= ";IR; "F= ";
F
96 PRINT "MONTHLY PAYMENTS= ";
MP
114 PRINT AT 5,12;"YEAR ";Y
115 PRINT
121 PRINT"MO INT PAYMENT PRI
PAYMNT LOAN BAL."
130 FOR M=1 TO 12
140 LET I=P*F
150 LET PR=MP-I
160 LET E=P-PR
170 PRINT M; TAB 3;I; TAB 13;PR
; TAB 23;E
180 LET P=E
190 NEXT M
195 PRINT AT 21,5;"PRESS CONT.
TO CONTINUE"
196 SLOW
200 IF INKEY$<>"" THEN GOTO 200
201 IF INKEY$="" THEN GOTO 201
202 IF INKEY$="C" THEN GOTO 210
203 GOTO 200
210 NEXT Y
```

NEWS

AND THINGS

Well, here we are again for a roundup of news and observations on a variety of Timex/Sinclair topics.

It is rumoured that two software houses in the UK will be producing mice [mouses?] for the Spectrum. Mice are of course available everywhere; it's the interface that doesn't exist. Look to both OCP and Kempston to produce mouse interface boards in the next month to support their graphics software offerings.

Meanwhile on this side of the pond, U.S. software houses [hice?] are beginning to produce and market in the UK, 2068 software adapted for the Spectrum machine. A major software house doing this is U.S. Gold. But there are plenty of others, such as EPYX, OCEAM, and DATASOFT.

The QL, which has had a hard time of it over here, is coming down in price both in the UK and in Canada. In the UK, Sinclair Research has cut the price of the QL from #399.95 to #199.95. In Canada, Gladstone Electronics in Toronto is now selling the QL for $599.95 (without monitor and printer, and with 128 K RAM).

According to Sinclair Research the price cut is possible due to "major savings from a substantial increase in manufacturing volume... we've also been able to cut costs through increases in efficiency based on experience gained in making QL's over the last year and a half." Rumour also has it that we can soon expect a new machine to be announced by Sinclair Research. However the Spectrum+ in the UK still enjoys 35% of the market in new sales, so don't count out the old machine just yet!

Is a 128K machine for $599.95 a bargain? An apple clone with one disk drive and 128K (monochrome) costs about $700.00. Are exceptional graphics more important to you than a disk drive in monochrome? For its price, in my opinion the QL continues to be a bargain, especially at the UK price!

For those interested in an inexpensive subscription to a Timex/Sinclair newsletter, try QuarTerS (QTS) published in New York State. A year's subscription costs $8.00 (U.S.) per year. To order a subscription, write to W.M.J. Data Systems, 4 Butterfly Drive, Hauppauge, N.Y., U.S.A. 11788.

That's it for this issue. As the next issue of this newsletter will be in 1986, Merry Christmas and a Happy Timex/Sinclair New Year to all!

- LEO FOSS

CONVERTING

Programs to ZX Basic

by: Bill Harmer

In the last article in this series we dealt with converting mathematical statements. In this article, logical statements will be discussed.

The colon (:) is used in most basics other than ZX basic (i.e. C64,Radio Shack) and is used to put two seperate statements together in one line. For example: 100 CLS: PRINT "SCREEN READY". This sort of statement would be accepted

by most computers other than the ZX-81, whose equivalent would be: 100 CLS
110 PRINT"SCREEN READY"

However, there is a special trick to converting programs using this in ZX basic when the first statement is an IF..Then statement because in the case where the statement following the if is not true, then the computer will skip to the next line ignoring the statements that follow on the same line.

So, 100 IF X=3 THEN PRINT" X=THREE":PRINT"NEXT INPUT" must be changed to: 100 IF x=3 THEN PRINT"X EQUALS THREE"
100 IF X=3 THEN PRINT"NEXT INPUT"

Another statement not seen in Sinclair basic is the IF.. THEN..ELSE statement. Replace this statement:

100 IF X=1 THEN PRINT" X EQUALS ONE" ELSE PRINT"X IS NOT EQUAL TO 1"

by the statements:

100 IF X=1 THEN PRINT" X EQUALS ONE"
110 IF NOT(X=1) THEN PRINT" X IS NOT EQUAL TO 1".

Another type of statement not allowed in ZX-81 basic is the ON..GOTO statement. This can be replaced by separate statements in ZX basic i.e.

```
10 IF N=1 THEN GOTO 100
20 IF N=2 THEN GOTO 200
30 IF N=3 THEN GOTO 300
```

ZX basic will also allow for computed GOTO statements to replace the ON..GOTO i.e.

```
10 GOTO (N=1)*100+(N=2)*200+(N=3)*300
```

or if the line numbers to GOTO are mathematically feasable,

```
10 GOTO N*100
```

GOSUBS follow the same general rule.

One more note concerning the IF..THEN..1050 statements do not forget that ZX basic requires the use of GOTO.. a line number, or LET in an assignment statement.

Thats all for now and there will be more coming later..

FAST

ZX-81 QUICK TAPE UTILITY

from Sinclair Programs/83

The following excerpt will allow all ZX-81 owners to save and load their favourate programs five (5) times faster than they can now. Depending on your cassette's capabilities, this program is ultra stable and virtually uncrashable.

Type in listing 1, (the first REM has 240 spaces in it), RUN it to load in the machine code in listing 2. delete listing 1 line-by-line and then type in listing 3.

Save the program by typing in GOTO 10. Do yourself a favour and save it at least twice to ensure that you have a good copy. A detailed instruction follows the listings.

LISTING 1

```
1 REM ( 240 0'S)
10 LET A$=""
20 INPUT B$
30 IF B$="S" THEN STOP
40 LET A$=A$+B$
50 CLS
60 PRINT A$
170 PRINT "LENGTH=";LEN A$/2;"
    BYTES"
80 GOTO 20
```

```
100 LET X=16514
105 FAST
110 IF A$="" THEN GOTO 160
120 POKE X,16*CODE A$+CODE
    A$(2)-476
130 LET A$=A$(3 TO )
140 LET X=X+1
150 GOTO 110
160 SLOW
170 STOP
```

LISTING 2 (M/C-read from left)

Machine code listing

16514	CD	23	0F	11	06	7F	CD	2B
16522	7F	CD	2B	0F	C9	CD	23	0F
16530	21	1D	7F	22	16	40	CD	70
16538	7F	CD	2B	0F	C9	0B	0B	0B
16546	00	00	00	00	00	00	CD	A8
16554	03	38	F9	EB	11	CB	12	CD
16562	46	0F	30	2E	10	FE	1B	7A
16570	B3	20	F4	CD	4E	7F	CB	7E
16578	23	28	F8	21	09	40	CD	4E
16586	7F	CD	FC	01	18	F8	5E	37
16594	CB	13	C8	9F	E6	02	C6	01
16602	4F	D3	FF	06	23	10	FE	CD
16610	46	0F	30	72	06	1E	10	FE
16618	0D	20	EE	C3	D8	7F	18	E0
16626	CD	A8	03	CB	12	CB	0A	CD
16634	7C	7F	18	FB	0E	01	06	00
16642	3E	7F	DB	FE	D3	FF	1F	30
16650	49	17	17	38	28	10	F1	F1
16658	BA	D2	E5	03	62	6B	CD	7C
16666	7F	CB	7A	79	20	03	BE	20
16674	D6	23	17	30	F1	FD	34	15
16682	21	09	40	50	CD	7C	7F	71
16690	CD	FC	01	18	F6	D5	1E	31
16698	06	0E	1D	DB	FE	17	CB	7B
16706	7B	38	F5	10	F5	D1	20	04
16714	FE	56	30	B2	3F	CB	11	30
16722	AD	C9	7A	A7	28	BB	CF	0C
16730	A7	06	50	10	FE	C3	6E	7F
16738	21	82	40	11	00	7F	01	E0
16746	00	ED	B0	21	FF	7E	22	04
16754	40	C3	C3	03				

LISTING 3

```
10 SAVE "FAST TAPE"
20 PRINT"FAST TAPE"
30 PRINT"TO SAVE-RAND USR
         32512"
40 PRINT"TO LOAD-RAND USR
         32525"
50 PAUSE 150
60 RAND USR 16738
```

4th Corner

SWAN SONG!

```
  : SWAN SONG HWS ?DUP 0=
    ENDIF ;
```

XFORTH XCHANGE and effectively Hawg Wild Software has bitten the dust! The company is blaming its demise on the disapearing market and the fact that the Portugese TIMEX 2068 failed to revitalize the situation. The balance of its stock will will be the balance of the company. On sale are, of course XFORTH, ABERSOFT FORTH, HISOFT C, DEVPAC-3, HISOFT PASCAL, and odds and ends.

As a further excerpt from the Xforth Xchange newsletter you will find herewith a joystick impementation in ABERSOFT FORTH.

```
0 ( SCR #131 STICK  EAW 4-15-85
XFORTH XCHANGE)
1 : WALL ;
2 HEX
3 : JPNEXT (---) C3 C, 2C C,
91 C, ; IMMEDIATE
4 CREATE STICK (---n)
  C5 C,
5 3E C, 0E C,
  D3 C, F5 C,
6 06 C, 01 C,
7 0E C, F6 C,
8 ED C, 78 C,
  2F C,

9 E6 C, 8F C,
  26 C, 00 C,
10 6F C, C1 C,
11 E5 C,
12 JPNEXT SMUDGE
13 ( STICK RETURNS A NUMBER ON
THE STACK = X000YYYY, BINARY)
14 ( X=1,BUTTON=0 NO BUTTON
YYYY=00,CENTER =01,FORWARD
15 ( =02,BACK =04,LEFT =08,
RIGHT  ) DECIMAL ;S
```

Reviews

TITLE: Mini Xmod 1.7
AVAILABLE FROM: Zebra Systems
N.Y.C.
PRICE: $19.95 (U.S.)

One of the problems in communicating with my ZX-81 and BYTE-BACK Modem is that while text can be uploaded and downloaded from Bulletin Board Systems, programs can not (they can however be sent directly by telephone to other ZX-81 owners with BYTE-BACK modems). The reason for this is that the BYTE-BACK Modem only supports XON-XOFF protocol on text transfer. (XON-XOFF are signals exchanged by two communicating computers. They control the communications, by telling the sending computer to stop sending data until an XON is received. These signals are needed in order to give the receiving computer time to process the received data.) BYTE-BACK software also does not support XMODEM protocol. XMODEM is a sophisticated error-checking protocol in which the receiving computer receives two checksums at the end of each block of data sent. If it cannot verify the data received, a signal is sent telling the sending computer to retransmit the last block.

It was therefore with some surprise that I learned that Zebra Systems in New York City was marketing XMODEM software for the ZX-81 and BYTE-BACK Modem. I promptly sent in my order.

About 4 weeks later, a tape arrived in the mail. According to the label on the tape there were two versions: a 16K version, and a 64K version (which loads into the 8-12K area).

First surprise. No manual.

Not to worry, I fired up the program and found it menu-driven. I had no difficulty in making it work, except that I couldn't figure out how to run the downloaded program (which is why I bought it in the first place). A telephone call to Zebra Systems confirmed they had forgotten to include the manual. Three weeks later the manual arrived.

I have since uploaded ZX-81 programs to my BBS (997-1967), and then downloaded them, and run them successfully. The program works as advertised.

A few problems, though. First, the non-standard terminology put me off. For example, "Duplex" is called "Simplex" for some reason. Translating a downloaded program into Sinclair Basic is called "Transfer", etc. Second, line feeds from the sending BBS cause a line of inverse "J"'s down the left side of the screen. The manual says to configure the BBS not to send line feeds, but on many BBS's (including my own) this can't be done. Third, straight ASCII text can't be saved. So if you want to save incoming data (not file data), forget it!

On the plus side, it lets you use the full 16K-64K area, so a full 48K program can be uploaded or downloaded (BYTE-BACK software only permits about 12K). Also it is pleasantly easy to operate.

Anyone who has a BYTE-BACK Modem has BYTE-BACK software. If you view the Mini XMOD 1.7 as a supplementary software only for file exchange, it is a valuable investment, and highly recommended.

PERSONALS

SECRET AGENT

```
  10 REM SECRET AGENT IS AN ORIG
INAL PROGRAM FOR THE ZX-81 BY BI
LL HARMER,OTTAWA-AND IS AVAILABL
E  FOR THE PERSONAL USE OF MEMBE
RS OF THE OTTAWA-HULL TIMEX/SINC
LAIR USER GROUP
  50 DIM X(100)
  60 PRINT AT 10,0;"*          SE
CRET AGENT          *"
  65 PRINT AT 9,0;"*
                    *"
  67 PRINT AT 11,0;"*
                    *"
  70 PRINT AT 8,0;"*
                    *"
  72 PRINT AT 12,0;"*
                    *"
  75 PRINT AT 7,0;"*************
*******************"
  77 PRINT AT 13,0;"************
********************"
```

```
  90 PRINT AT 21,0;"PRESS ""ENTE
R"" KEY TO GO ON"
  95 INPUT A$
  96 CLS
  97 IF A$="SESAME" THEN GOTO 90
00
 100 PRINT "SECRET AGENT IS A PR
OGRAM        DESIGNED TO ENCODE A
ND DECODE    SECRET MESSAGES"
 101 PRINT
 102 PRINT "A MESSAGE IS ENTERED
 AND THE     COMPUTER WILL CONVER
T IT TO A    SEQUENCE OF UNINTELL
IGIBLE       NUMBERS. THE MESSAGE
 CAN BE      DECIPHERED BY ANOTHE
R PERSON     HAVING THE SAME PROG
RAM"
 103 PRINT
 104 PRINT "ONE MUST KNOW HOWEVE
R WHICH OF   THE FOUR CODING OPTI
ONS HAVE     BEEN USED"
 105 PRINT
 106 PRINT "VARYING THE CODING O
PTION MAKES THE CODE MORE SECURE
"
 110 PRINT AT 21,0;"PRESS ENTER
TO GO ON"
 112 INPUT A$
 114 CLS
 115 PRINT "ENTER ""CODE"" OR ""
DECODE"" DEPEND-ING ON WHETHER Y
OU WISH TO CODE A NEW MESSAGE OR
 DECODE A CODED MESSAGE"
 120 INPUT M$
 130 PRINT
 140 PRINT "ENTER WHICH CODE YOU
  ARE USING (1,2,3,OR 4)"
 150 INPUT W
 155 PRINT
 160 IF W<>1 AND W<>2 AND W<>3 A
ND W<>4 THEN PRINT AT 10,0;"ENTE
R ONLY ONE OF THE NUMBERS 1,2,3
OR 4. TRY AGAIN"
 170 IF W<>1 AND W<>2 AND W<>3 A
ND W<>4 THEN GOTO 150
 180 LET I=W
 190 IF W=2 THEN LET I=5
 200 IF W=4 THEN LET I=7
 210 REM "I" IS EXTRA INCREMENT
OF SUBSTITUTION,HERE SET TO 1,3,
5 OR 7 (BY CODE 1,3,2,4)
 220 CLS
 300 IF M$="CODE" OR M$="C" THEN
 GOTO 1000
 310 IF M$<>"CODE" AND M$<>"DECO
DE" AND M$<>"C" AND M$<>"D" THEN
 GOTO 115
 320 IF M$="D" OR M$="DECODE" TH
EN GOTO 2000
 330 GOTO 115
 925 REM SECRET AGENT PROGRAM MA
KES CODING AND DECODING CHILDSPL
AY,PROGRAM BY BILL HARMER,APR.19
85.ALL RIGHTS RESERVED
 950 PRINT "MEMORY USED UP= ";PE
EK 16396+256*PEEK 16397-16384;"
BYTES"
 990 STOP
1000 REM ENCODING ROUTINE
1010 PRINT "PROGRAM TO CODE A NE
W MESSAGE"
1020 PRINT "USING CODE NUMBER ";
W
1030 PRINT
1040 PRINT "ENTER YOUR MESSAGE N
OW (UP TO   100 CHARACTERS=APPRO
X. 20 WORDS)"
1045 PRINT
1050 PRINT "IF YOUR MESSAGE IS L
ONGER BREAK IT UP INTO SMALLER M
ESSAGES AND CODE THEM SEPARATELY
"
1055 PRINT
1060 PRINT AT 9,0;"ENTER MESSAGE
NOW"
1070 INPUT R$
1080 PRINT AT 9,0;"WAIT
    "
1095 IF (LEN R$)>12 THEN FAST
1100 LET F$=""
1110 REM IN OTHER COMPUTERS LINE
 1210 WOULD BE- U$=MID$(R$,N,1)
1200 FOR N=1 TO (LEN R$)
1210 LET U$=R$(N TO N)
1220 LET Y=(CODE (U$))
1225 IF Y<10 OR Y>63 THEN GOTO 1
300
1226 REM Y<33 OR Y>90 WOULD BE U
SED FOR LINE 1225 FOR ASCII
1230 LET Y=Y+7+I
1240 IF Y>63 THEN LET Y=Y-53
1245 REM IF Y>90 THEN LET Y=Y-58
 WOULD BE USED FOR LINE 1240 FOR
ASCII
1250 LET T$=STR$ Y
1270 LET F$=F$+T$+","
1300 NEXT N
1310 SLOW
1340 PRINT F$
1400 PRINT AT 20,0;"PRESS ENTER
TO CODE AGAIN OR    ENTER ""B""
TO GO BACK TO START"
1410 INPUT A$
1420 CLS
1440 IF A$="B" OR A$="BEGIN" THE
N GOTO 100
1460 GOTO 1000
2000 REM DECODING ROUTINE
2010 PRINT "PROGRAM TO DECODE A
NEW MESSAGE"
2020 PRINT "USING CODE NUMBER ";
W
2030 PRINT
2040 PRINT "ENTER THE CODED TEXT
 COMPLETE   WITH COMMAS BETWEEN
THE NUMBERS"
2045 PRINT
2050 PRINT "UP TO 100 NUMBERS AR
E ALLOWED INTHE TEXT";
2055 PRINT "(NO SPACES ARE PLACE
D IN THE DECODED TEXT)"
2060 PRINT
2065 PRINT AT 9,0;"ENTER MESSAGE
NOW"
2070 INPUT P$
2080 PRINT AT 9,0;"WAIT
    "
2085 IF LEN P$>36 THEN FAST
2090 LET G$=""
2100 REM IN OTHER COMPUTERS FOR
LINE 2210 SAY-U$=MID$(P$,N,1) AN
D 2215 V$=MID$(P$,N+1,1)
2200 FOR N=1 TO (LEN P$) STEP 3
2210 LET U$=P$(N TO N)
2215 LET V$=P$(N+1 TO N+1)
2217 LET M=((N-1)/3)+1
2220 LET X(M)=VAL (U$+V$)
2230 IF X(1)=0 THEN LET P$=F$
2235 IF X(1)=0 THEN GOTO 2090
```

```
2237 LET X(M)=(X(M)-7)-I
2240 IF X(M)<11 THEN LET X(M)=X(
M)+53
2250 REM IF X(M)<33 THEN LET X(M
)=X(M)+58 FOR ASCII IN LINE 2240
2260 LET G$=G$+CHR$ (X(M))
2290 NEXT N
2295 SLOW
2300 REM "0000"(4 ZEROS) ENTERED
 WILL RESULT IN PREVIOUSLY CODED
 TEXT BEING ENTERED FOR DECODING
 AS A TEST
2320 PRINT G$
2350 PRINT AT 20,0;"PRESS ENTER
TO DECODE AGAIN OR  ENTER ""B""
TO GO BACK TO START"
2360 INPUT A$
2365 CLS
2370 IF A$="B" OR A$="BEGIN" THE
N GOTO 100
2380 GOTO 2000
9000 CLS
9010 PRINT "CASSETTE SAVE BEGINS
"
9020 PAUSE 200
9025 CLEAR
9030 SAVE "SECRET AGEN"
9040 CLS
9050 GOTO 50
```

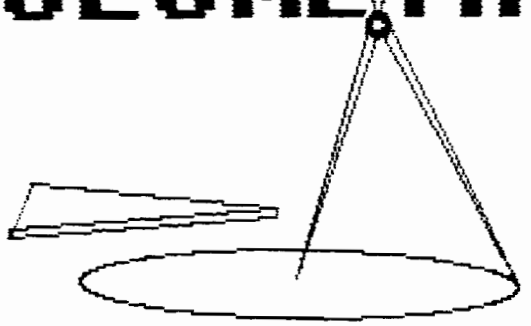
WORD INVADERS

```
   1 REM ************************
         *     WORD INVADERS    *
         *    BY   JIM TURNER   *
         ************************
   2 REM ************************
         * FOR THOSE ANNOYING   *
         * PEOPLE WHO NEED TO   *
         * PRACTICE THEIR TYPING
         * BUT PREFER TO PLAY   *
         * VIDEO GAMES.....     *
         ************************

   5 LET YOU=0: LET THEM=0
   6 LET SPEED=30: LET ERROR=0
  10 GO SUB 9000: LET H=0: LET p
os=1: LET e$="
"
  20 CLS
  30 GO SUB 4000
 100 LET x=RND*(32-LEN a$)
 105 PRINT AT 0,x;a$;AT 20,x;"↑"
 110 FOR y=0 TO 19
 120 PRINT AT y,x;e$( TO LEN a$)
 125 PRINT AT y+1,x;a$(pos TO )
 126 PAUSE SPEED
 129 LET i$=INKEY$: IF i$<>"" TH
EN GO SUB 1000
 130 IF H=1 THEN GO TO 10
 900 NEXT Y
 910 LET THEM=THEM+1
 920 BEEP .5,-20: GO TO 10
1000 IF i$=a$(pos) THEN GO SUB 2
000: RETURN
1010 LET ERROR=ERROR+1: PRINT AT
 21,18;ERROR: IF ERROR=5 THEN LE
T ERROR=0: LET THEM=THEM+1
1020 RETURN
2000 LET O=(X*8)+4: LET U=146-(Y
*8)
2005 PLOT O,15: DRAW 0,U: BEEP .
005,10. BEEP .005,-10: PLOT OVER
 1;O,15: DRAW OVER 1;0,U
2010 LET pos=pos+1: IF pos>LEN a
$ THEN GO SUB 3000
2020 RETURN
3000 LET H=1: LET YOU=YOU+1: PRI
NT AT Y,X;" ": FOR B=0 TO 40 STE
P 5: BEEP .005,B: NEXT B: RETURN

4000 PRINT AT 21,0;"YOU-";YOU;AT
 21,23;"THEM-";THEM;AT 21,12;"ER
ROR-";ERROR: LET SKILL=0+(YOU-TH
EM): IF SKILL>29 THEN LET SKILL=
29
4005 IF SKILL<0 THEN LET SKILL=0
4010 LET SPEED=30-SKILL
4020 RETURN
8999 STOP
9000 REM PUT AS MANY WORDS IN
         DATA STATEMENTS AS YOU
         LIKE JUST CHANGE W1 IN
         LINE 9001 TO MATCH THE
         NUMBER OF ENTRIES
9001 LET W1=30: RESTORE 9000: FO
R W=1 TO RND*W1+1: READ A$: NEXT
 W: RETURN
9010 DATA "JIM","MOM","GEORD","M
IKE","JOSH","DANNY","OMA","OPA",
"DENNIS","ALAIN"
9020 DATA "THEN", "THEM","AUTO",
"APRIL","JUMP","THE","THEIR","LI
VRE","MAISON","DISK","ROLL","TAP
E","POSTER","BOOK"
9030 DATA "LIST","TABLE","ROBOT"
,"PORTE","MUR","PAPER"
9500 SAVE "WORDS"
9510 INK 7: PAPER 0: BORDER 0: C
LS
9520 PRINT AT 10,13;"READY"
9530 GO SUB 9600
9540 PRINT AT 10,13;" SET "
9545 GO SUB 9600
9550 PRINT AT 10,13;"  GO "
9560 GO SUB 9600: RUN
9600 BEEP .25,0: PAUSE 35: RETUR
N
9900 RETURN
```

GEOMETRY



```
   1 REM This program calculates
area, volume and other values of
spheres, triangles, circles,
cones and rectangles. It is a
2068 program
   5 GO SUB 9100
  10 PAPER 1: INK 7: BORDER 1: L
ET r$="GEOMETRY": GO SUB 9000
  15 PRINT FLASH 1;AT 5,0;"Selec
t"; FLASH 0;"'"1)  Triangle?"'"2
)  Rectangle?"'"3)  Circle?"'"
4)  Cylinder?"'"5)  Cone?"'"6)
  Sphere?"
  20 INPUT r$
  25 GO TO 20+(10 AND r$="1")+(4
80 AND r$="2")+(980 AND r$="3")+
(1480 AND r$="4")+(1980 AND r$="
5")+(2480 AND r$="6")
  30 LET r$="TRIANGLE": GO SUB 9
000
  35 INK 6: PLOT 100,28: DRAW 15
5,0: DRAW -50,50: DRAW -105,-50:
 PRINT AT 18,23;"a";AT 14,20,"b"
;AT 14,28;"c";AT 17,16;"α";AT 17
,29;"e";AT 13,25;"ø": INK 7
  40 LET r=0: PRINT FLASH 1; INK
 6;AT 4,6;"Three values required
"; FLASH 0; INK 7'"Side a.......
=";w$(18 TO )'"Side b.......=";w
$(18 TO )'"Side c.......=";w$(18
 TO )'"Angle α (deg)=";w$(18 TO
)'"Angle e (deg)=";w$(18 TO )'"A
ngle ø (deg)=";w$(18 TO )'"Area.
........=";w$(18 TO )
  45 LET r$="length of side a":
GO SUB 9300: INPUT a$: PRINT AT
5,14;a$: IF a$="?" THEN LET r=r+
1
  50 LET r$="length of side b":
GO SUB 9300: INPUT b$: PRINT AT
6,14;b$: IF b$="?" THEN LET r=r+
1
  55 LET r$="length of side c":
GO SUB 9300: INPUT c$: PRINT AT
7,14;c$: IF c$="?" THEN LET r=r+
1
  60 LET r$="angle α in degrees"
: GO SUB 9300: INPUT d$: PRINT A
T 8,14;d$: IF d$="?" THEN LET r=
r+1
  65 LET r$="angle e in degrees"
: GO SUB 9300: INPUT e$: PRINT A
T 9,14;e$: IF e$="?" THEN LET r=
r+1
  70 LET r$="angle ø in degrees"
: GO SUB 9300: INPUT f$: PRINT A
T 10,14;f$: IF f$="?" THEN LET r
=r+1
  75 IF r>3 THEN GO SUB 9405: GO
 TO 40
  80 IF r<3 THEN GO SUB 9415: GO
 TO 40
  85 GO TO 40+(50 AND a$<>"?" AN
D b$<>"?" AND c$<>"?")+(85 AND a
$<>"?" AND b$<>"?" AND d$<>"?")+
(120 AND a$<>"?" AND b$<>"?" AND
 e$<>"?")+(155 AND a$<>"?" AND c
$<>"?" AND d$<>"?")+(190 AND a$<
>"?" AND c$<>"?" AND e$<>"?")+(2
25 AND a$<>"?" AND d$<>"?" AND e
$<>"?")+(260 AND b$<>"?" AND c$<
>"?" AND d$<>"?")+(295 AND b$<>"
?" AND c$<>"?" AND e$<>"?")+(330
 AND b$<>"?" AND d$<>"?" AND e$<
>"?")+(365 AND c$<>"?" AND d$<>"
?" AND e$<>"?")
  90 LET d=ACS (((VAL b$)↑2+(VAL
 a$)↑2-(VAL c$)↑2)/(2*VAL a$*VAL
 b$))
  95 LET e=ACS (((VAL c$)↑2+(VAL
 a$)↑2-(VAL b$)↑2)/(2*VAL a$*VAL
 c$))
 100 LET f=.01*INT (.5+18000*(PI
-d-e)/PI)
 105 LET g=.01*INT (.5+50*VAL a$
*VAL b$*SIN d)
 110 LET d=.01*INT (.5+18000*d/P
I)
 115 LET e=.01*INT (.5+18000*e/P
I)
 120 PRINT AT 8,14;d;AT 9,14;e;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 125 LET d=(PI/180)*VAL d$: LET
c=SQR ((VAL b$)↑2+(VAL a$)↑2-2*V
AL a$*VAL b$*COS d)
 130 LET e=ASN ((VAL b$*SIN d)/c
): LET c=.01*INT (.5+100*c)
 135 LET f=.01*INT (.5+18000*(PI
-d-e)/PI)
 140 LET g=.01*INT (.5+50*VAL a$
*VAL b$*SIN d)
 145 LET d=.01*INT (.5+18000*d/P
I)
 150 LET e=.01*INT (.5+18000*e/P
I)
 155 PRINT AT 7,14;c;AT 9,14;e;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 160 LET e=(PI/180)*VAL e$: LET
f=ASN ((VAL a$*SIN e)/VAL b$)
 165 LET d=PI-f-e
 170 LET g=.01*INT (.5+50*VAL a$
*VAL b$*SIN d)
 175 LET c=.01*INT (.5+100*(VAL
b$*SIN d/SIN e))
 180 LET f=.01*INT (.5+18000*f/P
I)
 185 LET d=.01*INT (.5+18000*d/P
I)
 190 PRINT AT 7,14;c;AT 8,14;d;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 195 LET d=(PI/180)*VAL d$: LET
f=ASN ((VAL a$*SIN d)/VAL c$)
 200 LET e=PI-f-d
 205 LET b=.01*INT (.5+100*(VAL
c$*SIN e/SIN d))
```

```
 210 LET g=.01*INT (.5+50*VAL a$
*b*SIN d)
 215 LET e=.01*INT (.5+18000*e/P
I)
 220 LET f=.01*INT (.5+18000*f/P
I)
 225 PRINT AT 6,14;b;AT 9,14;e;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 230 LET e=(PI/180)*VAL e$: LET
b=SQR ((VAL a$)↑2+(VAL c$)↑2-2*V
AL a$*VAL c$*COS e)
 235 LET d=ACS ((VAL a$↑2+b↑2-VA
L c$↑2)/(2*b*VAL a$))
 240 LET f=.01*INT (.5+100*(180*
(PI-d-e)/PI))
 245 LET g=.01*INT (.5+50*VAL a$
*VAL c$*SIN e)
 250 LET b=.01*INT (.5+100*b)
 255 LET d=.01*INT (.5+18000*d/P
I)
 260 PRINT AT 6,14;b;AT 8,14;d;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 265 LET d=(PI/180)*VAL d$: LET
e=(PI/180)*VAL e$
 270 LET f=(PI-d-e)
 275 LET b=VAL a$*SIN e/SIN f
 280 LET c=.01*INT (.5+100*b*SIN
 d/SIN e)
 285 LET g=.01*INT (.5+50*VAL a$
*c*SIN e)
 290 LET b=.01*INT (.5+100*b): L
ET f=.01*INT (.5+18000*f/PI)
 295 PRINT AT 6,14;b;AT 7,14;c;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 300 LET d=PI*VAL d$/180: LET e=
ASN (VAL b$*SIN d/VAL c$)
 305 LET f=PI-d-e: LET g=.01*INT
 (.5+50*VAL b$*VAL c$*SIN f)
 310 LET a=.01*INT (.5+100*VAL c
$*SIN f/SIN d)
 315 LET f=.01*INT (.5+18000*f/P
I)
 320 LET d=.01*INT (.5+100*d)
 325 LET e=.01*INT (.5+18000*e/P
I)
 330 PRINT AT 5,14;a;AT 9,14;e;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 335 LET e=PI*VAL e$/180: LET d=
ASN (VAL c$*SIN e/VAL b$)
 340 LET f=PI-d-e
 345 LET a=.01*INT (.5+100*VAL b
$*SIN f/SIN e)
 350 LET g=.01*INT (.5+50*VAL b$
*VAL c$*SIN f)
 355 LET f=.01*INT (.5+18000*f/P
I)
 360 LET d=.01*INT (.5+18000*d/P
I)
 365 PRINT AT 5,14;a;AT 8,14;d;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 370 LET d=PI*VAL d$/180: LET e=
PI*VAL e$/180
 375 LET f=PI-d-e
 380 LET c=.01*INT (.5+100*VAL b
$*SIN d/SIN e)
 385 LET a=VAL b$*SIN f/SIN e
 390 LET g=.01*INT (.5+50*a*VAL
b$*SIN d): LET f=.01*INT (.5+180
00*f/PI)
 395 LET a=.01*INT (.5+100*a)
 400 PRINT AT 5,14;a;AT 7,14;c;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 405 LET d=PI*VAL d$/180: LET e=
PI*VAL e$/180
 410 LET f=PI-d-e
 415 LET b=VAL c$*SIN e/SIN d
 420 LET a=VAL c$*SIN f/SIN d
 425 LET g=.01*INT (.5+50*a*b*SI
N d): LET f=.01*INT (.5+18000*f/
PI)
 430 LET b=.01*INT (.5+100*b): L
ET a=.01*INT (.5+100*a)
 435 PRINT AT 5,14;a;AT 6,14;b;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 470 PRINT AT 8,14;d;AT 9,14;e;A
T 10,14;f;AT 11,14;g: GO SUB 940
0: GO TO 10
 500 REM [redacted]
 505 LET r$="RECTANGLE": GO SUB
9000
 510 PLOT 140,45: INK 6: DRAW 10
0,0: DRAW 0,50: DRAW -100,0: DRA
W 0,-50: PRINT AT 15,24;"a";AT 1
2,29;"b": INK 7
 515 LET r=0: PRINT FLASH 1; INK
 6;AT 4,7;"Two values required";
 FLASH 0; INK 7'"Length of side
a=";w$(18 TO )'"Length of side b
=";w$(18 TO )'"Perimeter.......=
";w$(18 TO )'"Area............="
;w$(18 TO )
 520 LET r$="length of side a":
GO SUB 9300
 525 INPUT a$
 530 PRINT AT 5,17;a$: IF a$="?"
 THEN LET r=r+1
 535 LET r$="length of side b":
GO SUB 9300
 540 INPUT b$
 545 PRINT AT 6,17;b$: IF b$="?"
 THEN LET r=r+1
 550 LET r$="perimeter": GO SUB
9300
 555 INPUT c$
 560 PRINT AT 7,17;c$: IF c$="?"
 THEN LET r=r+1
 565 LET r$="area": GO SUB 9300
 570 INPUT d$
 575 PRINT AT 8,17;d$: IF d$="?"
 THEN LET r=r+1
 580 IF r>2 THEN GO SUB 9405: GO
 TO 515
 582 IF r<2 THEN GO SUB 9415: GO
 TO 515
 585 GO TO (590 AND (a$<>"?" AND
 b$<>"?")+(610 AND (a$<>"?" AND
 c$<>"?")+(630 AND (a$<>"?" AND
 d$<>"?")+(650 AND (b$<>"?" AND
 c$<>"?")+(670 AND (b$<>"?" AND
 d$<>"?")+(690 AND (c$<>"?" AND
 d$<>"?"))
 590 LET c=.01*INT (.5+100*(2*(V
AL a$+VAL b$)))
 595 LET d=.01*INT (.5+100*(VAL
a$*VAL b$))
 600 PRINT AT 7,17;c;AT 8,17;d:
GO SUB 9400: GO TO 10
 610 LET b=.01*INT (.5+100*(VAL
c$/2-VAL a$))
 615 LET d=.01*INT (.5+100*b*VAL
 a$)
```

```
 620 PRINT AT 6,17;b;AT 8,17;d:
GO SUB 9400: GO TO 10
 630 LET b=.01*INT (.5+100*VAL d
$/VAL a$)
 635 LET c=.01*INT (.5+200*(b+VA
L a$))
 640 PRINT AT 6,17;b;AT 7,17;c:
GO SUB 9400: GO TO 10
 650 LET a=.01*INT (.5+100*(VAL
c$/2-VAL b$))
 655 LET d=.01*INT (.5+100*a*VAL
 b$)
 660 PRINT AT 5,17;a;AT 8,17;d:
GO SUB 9400: GO TO 10
 670 LET a=.01*INT (.5+100*VAL d
$/VAL b$)
 675 LET c=.01*INT (.5*200*(VAL
b$+a))
 680 PRINT AT 5,17;a;AT 7,17;c:
GO SUB 9400: GO TO 10
 690 LET x=.01*INT (.5+100*((.25
*(VAL c$)↑2-4*VAL d$) AND (4*VAL
 d$<=.25*(VAL c$)↑2)))
 695 IF x=0 THEN GO SUB 9410: GO
 TO 515
 700 LET b=.01*INT (.5+100*(VAL
c$/2-SQR x))
 705 LET a=.01*INT (.5+100*VAL d
$/b)
 710 PRINT AT 5,17;a;AT 6,17;b:
GO SUB 9400: GO TO 10
1000 REM [redacted]
1005 LET r$="CIRCLE": GO SUB 900
0
1010 INK 6: CIRCLE 200,75,30
1015 PLOT 200,75: DRAW 30,0: PRI
NT AT 12,27;"R": INK 7
1020 LET r=0: PRINT FLASH 1; INK
 6;AT 4,7;"One value required";
FLASH 0; INK 7'"Radius(R)....=";
w$(15 TO )'"Circumference=";w$(1
5 TO )'"Area.........=";w$(15 TO
 )
1025 LET r$="radius of circle":
GO SUB 9300
1030 INPUT d$: PRINT AT 5,14;d$:
 IF d$="?" THEN LET r=r+1
1035 LET r$="circumference of ci
rcle": GO SUB 9300
1040 INPUT c$: PRINT AT 6,14;c$:
 IF c$="?" THEN LET r=r+1
1045 LET r$="area of circle": GO
 SUB 9300
1050 INPUT a$: PRINT AT 7,14;a$:
 IF a$="?" THEN LET r=r+1
1052 IF r<=1 THEN GO SUB 9415: G
O TO 1020
1054 IF r=3 THEN GO SUB 9405: GO
 TO 1020
1055 GO TO 1020+(40 AND d$<>"?")
+(80 AND c$<>"?")+(110 AND a$<>"
?")
1065 LET c=.01*INT (.5+100*(2*PI
*VAL d$))
1070 LET a=.01*INT (.5+100*(PI*(
VAL d$)↑2))
1075 PRINT AT 5,14;VAL d$;AT 6,1
4;c;AT 7,14;a: GO SUB 9400: GO T
O 10
1100 LET d=.01*INT (.5+100*VAL c
$/(2*PI))
1105 LET a=.01*INT (.5+25*(VAL c
$)↑2/PI)
1110 PRINT AT 5,14;d;AT 7,14;a:
GO SUB 9400: GO TO 10
1130 LET d=.01*INT (.5+100*SQR (
VAL a$/PI))
1135 LET c=.01*INT (.5+200*SQR (
PI*VAL a$))
1140 PRINT AT 5,14;d;AT 6,14;c:
GO SUB 9400: GO TO 10
1500 REM [redacted]
1505 LET r$="CYLINDER": GO SUB 9
000
1510 INK 6: PLOT 240,80: DRAW -7
6,0,.5*PI: DRAW 76,0,.5*PI: DRAW
 0,-46: DRAW -76,0,-.5*PI: DRAW
0,46: PLOT 202,80: DRAW 38,0: PR
INT AT 11,27;"R";AT 15,19;"H": I
NK 7
1515 LET r=0: PRINT FLASH 1; INK
 6;AT 4,7;"Two values required";
 FLASH 0; INK 7'"Radius R....=";
w$(18 TO )'"Height H....=";w$(18
 TO )'"Volume.......=";w$(18 TO )
'"Surface Area=";w$(18 TO )
1520 LET r$="radius R": GO SUB 9
300
1525 INPUT d$
1530 PRINT AT 5,13;d$: IF d$="?"
 THEN LET r=r+1
1535 LET r$="height H": GO SUB 9
300
1540 INPUT b$
1545 PRINT AT 6,13;b$: IF b$="?"
 THEN LET r=r+1
1550 LET r$="volume of cylinder"
: GO SUB 9300
1555 INPUT c$
1560 PRINT AT 7,13;c$: IF c$="?"
 THEN LET r=r+1
1565 LET r$="surface area of cyl
inder": GO SUB 9300
1570 INPUT a$
1575 PRINT AT 8,13;a$: IF a$="?"
 THEN LET r=r+1
1580 IF r>2 THEN GO SUB 9405  GO
 TO 1515
1585 IF r<2 THEN GO SUB 9415: GO
 TO 1515
1590 GO TO 1515+(60 AND d$<>"?"
AND b$<>"?")+(100 AND d$<>"?" AN
D c$<>"?")+(120 AND d$<>"?" AND
a$<>"?")+(140 AND b$<>"?" AND c$
<>"?")+(160 AND b$<>"?" AND a$<>
"?")+(180 AND c$<>"?" AND a$<>"?
")
1595 LET c=.01*INT (.5+100*(PI*V
AL b$*(VAL d$)↑2))
1600 LET a=.01*INT (.5+100*(2*PI
*VAL d$*VAL b$))
1605 PRINT AT 7,13;c;AT 8,13;a:
GO SUB 9400: GO TO 10
1615 LET b=VAL c$/(PI*(VAL d$)↑2
)
1620 LET a=.01*INT (.5+200*PI*b*
VAL d$)
1625 LET b=.01*INT (.5+100*b)
1630 PRINT AT 6,13;a;AT 6,13;b:
GO SUB 9400: GO TO 10
1635 LET b=VAL a$/(2*PI*VAL d$)
1640 LET c=.01*INT (.5+100*PI*b*
(VAL d$)↑2)
1645 LET b=.01*INT (.5+100*b)
1650 PRINT AT 7,13;c;AT 6,13;b:
GO SUB 9400: GO TO 10
```

```
1655 LET d=SQR (VAL c$/(PI*VAL b
$))
1660 LET a=.01*INT (.5+200*PI*d*
VAL b$)
1665 LET d=.01*INT (.5+100*d)
1670 PRINT AT 8,13;a;AT 5,13;d:
GO SUB 9400: GO TO 10
1675 LET d=VAL a$/(2*PI*VAL b$)
1680 LET c=.01*INT (.5+100*PI*d↑
2*VAL b$)
1685 LET d=.01*INT (.5+100*d)
1690 PRINT AT 7,13;c;AT 5,13;d:
GO SUB 9400: GO TO 10
1695 LET d=2*VAL c$/VAL a$
1700 LET b=.01*INT (.5+100*(VAL
a$/(2*PI*d)))
1705 LET d=.01*INT (.5+100*d)
1710 PRINT AT 5,13;d;AT 6,13;b:
GO SUB 9400: GO TO 10
2000 REM [redacted]
2005 LET r$="CONE": GO SUB 9000
2010 INK 6: PLOT 202,90: DRAW 0,
-50: DRAW 38,0: DRAW -76,0,-.5*P
I: DRAW 76,0,-.5*PI: DRAW -38,50
: DRAW -38,-50: PRINT AT 16,27;"
R";AT 13,27;"S": INK 7
2015 LET r=0: PRINT FLASH 1; INK
 6;AT 4,7;"Two values required";
 FLASH 0; INK 7'"Radius R....=";
w$(18 TO )'"Height S....=";w$(18
 TO )'"Volume.....=";w$(18 TO )
'"Surface Area=";w$(18 TO )
2020 LET r$="radius R": GO SUB 9
300
2025 INPUT d$
2030 PRINT AT 5,13;d$: IF d$="?"
 THEN LET r=r+1
2050 LET r$="height S": GO SUB 9
300
2055 INPUT s$
2060 PRINT AT 6,13;s$: IF s$="?"
 THEN LET r=r+1
2065 LET r$="volume of cone": GO
 SUB 9300
2070 INPUT c$
2075 PRINT AT 7,13;c$: IF c$="?"
 THEN LET r=r+1
2080 LET r$="surface area of con
e": GO SUB 9300
2085 INPUT a$
2090 PRINT AT 8,13;a$: IF a$="?"
 THEN LET r=r+1
2095 IF r>2 THEN GO SUB 9405: GO
 TO 2015
2100 IF r<2 THEN GO SUB 9415: GO
 TO 2015
2105 GO TO 2015+(95 AND d$<>"?"
AND s$<>"?")+(120 AND d$<>"?" AN
D c$<>"?")+(145 AND d$<>"?" AND
a$<>"?")+(170 AND s$<>"?" AND c$
<>"?")+(195 AND s$<>"?" AND a$<>
"?")+(220 AND c$<>"?" AND a$<>"?
")
2110 LET c=.01*INT (.5+100*PI*VA
L d$↑2*SQR (VAL s$↑2-VAL d$↑2)/3
)
2115 LET a=.01*INT (.5+100*PI*VA
L d$*VAL s$)
2120 PRINT AT 7,13;c;AT 8,13;a:
GO SUB 9400: GO TO 10
2135 LET s=SQR ((3*VAL c$/(PI*VA
L d$↑2))↑2+VAL d$↑2)
2140 LET a=.01*INT (.5+100*PI*VA
L d$*s)
2145 LET s=.01*INT (.5+100*s)
2155 PRINT AT 6,13;s;AT 8,13;a:
GO SUB 9400: GO TO 10
2160 LET s=VAL a$/(PI*VAL d$)
2165 LET c=(PI/3)*VAL d$↑2*SQR (
s↑2-VAL d$↑2)
2170 LET s=.01*INT (.5+100*s)
2175 LET c=.01*INT (.5+100*c)
2180 PRINT AT 6,13;s;AT 7,13;c:
GO SUB 9400: GO TO 10
2185 PRINT FLASH 1; INK 6;AT 19,
2;"Sorry, no solution available"
: FLASH 0: INK 7: GO SUB 9400: G
O TO 10
2210 LET d=VAL a$/(PI*VAL s$)
2215 LET c=(PI/3)*d↑2*SQR (VAL s
$↑2-d↑2)
2220 LET d=.01*INT (.5+100*d)
2225 LET c=.01*INT (.5+100*c)
2230 PRINT AT 6,13;s;AT 7,13;c:
GO SUB 9400: GO TO 10
2235 PRINT FLASH 1; INK 6;AT 19,
2;"Sorry, no solution available"
: FLASH 0: INK 7: GO SUB 9400: G
O TO 10
2500 REM [redacted]
2555 LET r$="SPHERE": GO SUB 900
0
2560 CIRCLE 200,75,30
2565 PLOT 200,75: DRAW 30,0: PRI
NT AT 12,27;"R"
2570 LET r=0: PRINT FLASH 1; INK
 6;AT 4,7;"One value required";
FLASH 0; INK 7'"Radius(R)....=";
w$(15 TO )'"Volume.....=";w$(1
5 TO )'"Surface area.=";w$(15 TO
 )
2575 LET r$="radius of sphere":
GO SUB 9300
2580 INPUT d$: PRINT AT 5,14;d$:
 IF d$="?" THEN LET r=r+1
2585 LET r$="volume of sphere":
GO SUB 9300
2590 INPUT c$: PRINT AT 6,14;c$:
 IF c$="?" THEN LET r=r+1
2595 LET r$="surface area of sph
ere": GO SUB 9300
2600 INPUT a$: PRINT AT 7,14;a$:
 IF a$="?" THEN LET r=r+1
2602 IF r<2 THEN GO SUB 9415: GO
 TO 2570
2604 IF r=3 THEN GO SUB 9405: GO
 TO 2570
2605 GO TO 2570+(40 AND d$<>"?")
+(80 AND c$<>"?")+(120 AND a$<>"
?")
2610 LET c=.01*INT (.5+100*((4*P
I/3)*(VAL d$)↑3))
2615 LET a=.01*INT (.5+400*PI*(V
AL d$)↑2)
2620 PRINT AT 6,14;c;AT 7,14;a:
GO SUB 9400: GO TO 10
2650 LET d=(3*VAL c$/(4*PI))↑(1/
3)
2655 LET a=.01*INT (.5+300*VAL c
$/d)
2660 LET d=.01*INT (.5+100*d)
2665 PRINT AT 5,14;d;AT 7,14;a:
GO SUB 9400: GO TO 10
2690 LET d=SQR (VAL a$/(4*PI))
2695 LET c=.01*INT (.5+100*((4*P
I/3)*d↑3))
2700 LET d=.01*INT (.5+100*SQR (
VAL a$/(4*PI)))
```

```
2705 PRINT AT 5,14;d;AT 6,14;c:
GO SUB 9400: GO TO 10
2710 SAVE "geometry" LINE 0: GO
TO 10
8999 STOP
9000 CLS : PRINT AT 0,0;"▛▜
▛▜"
9005 PRINT "▌
▐"
9010 PRINT "▙▟
▙▟"
9015 PRINT INK 6;AT 1,15-.5*LEN
r$;r$: RETURN
9100 RESTORE 9105: FOR y=1 TO 4:
 FOR x=0 TO 7:: READ a: POKE USR
 CHR$ (y+143)+x,a: NEXT x: NEXT
y
9105 DATA 0,0,0,98,148,136,148,9
8
9110 DATA 0,0,0,112,136,248,136,
112
9115 DATA 0,4,120,152,168,200,11
2,128
9120 DATA 0,0,8,48,208,80,84,152
9125 LET z$="(Enter ""?"" for un
known values)"
9130 LET w$="
                    "
9135 RETURN
9200 INK 6: PLOT 50,77: DRAW 155
,0: DRAW -50,50: DRAW -105,-50
9220 RETURN
9300 PRINT AT 20,0;w$+w$
9305 LET r$="Enter "+r$: PRINT A
T 20,15-.5*LEN r$;r$' INK 6;z$;
INK 7: RETURN
9400 PRINT AT 20,0;w$+w$;AT 21,3
;"Press any key to continue": PA
USE 0: RETURN
9405 PRINT AT 20,0;w$+w$; FLASH
  1; INK 6;AT 20,7;"More data re
quired"' INK 7; FLASH 0;"   Pres
s any key to continue": PAUSE 0:
 RETURN
9410 PRINT AT 20,0;w$+w$; FLASH
  1; INK 6;AT 20,2;"Irrational r
esult, try again"' INK 7; FLASH
0;"   Press any key to continue"
: PAUSE 0: RETURN
9415 PRINT AT 20,0;w$+w$; FLASH
  1; INK 6;AT 20,7;"Too many ent
ries"' INK 7; FLASH 0;"   Press
any key to continue": PAUSE 0: R
ETURN
```

DAILY JOURNAL

For the ZX81

By Iris ten Holder

```
   1 PRINT "PROGRAM 2 - DAILY JO
URNAL"
   5 GOTO 1000
   9 STOP
  15 GOSUB 100
  20 PRINT "SET UP ARRAYS"
  25 GOSUB 200
  29 CLS
  30 PRINT "INPUT DATA"
  35 GOSUB 300
  40 PRINT "CASUAL LABOUR"
  45 GOSUB 400
  55 GOSUB 500
  56 GOTO 66
  60 PRINT " LPRINT "
  65 GOSUB 600
  66 STOP
  70 PRINT "CUMULATIVE TOTALS -
CALCULATIONS"
  75 GOSUB 700
  81 GOSUB 8000
  82 GOTO 1000
  85 GOSUB 800
  89 GOTO 1000
  95 GOSUB 950
  98 PRINT AT 12,12;"END"
  99 STOP
 100 DIM A(7)
 105 DIM B(7)
 110 DIM R$(7,7)
 115 DIM R(7)
 120 DIM C$(13,6)
 125 DIM C(13)
 130 DIM E$(7,7)
 135 DIM E(7)
 140 DIM S$(28,6)
 145 DIM S(28)
 170 DIM X(7)
 175 DIM D(7)
 190 PRINT "RESET COMPLETED"
 195 PRINT
 199 RETURN
 200 REM ARRAYS
 205 PRINT "CASH REGISTER: DIVER
S BEER WINE LIQUOR CIGS"
 210 FOR J=1 TO 7
 212 INPUT R$(J)
 214 PRINT R$(J)
 216 NEXT J
 218 CLS
 220 PRINT "CASH: 1 2 5 10 20 50
 100 VISA MCH AMEX ENR CHQ IOU"
 222 FOR J=1 TO 13
 224 INPUT C$(J)
 225 PRINT C$(J)
 226 NEXT J
 228 CLS
 230 PRINT "NUMBERS OF EXPENSE A
CCOUNTS"
 232 PRINT "TYPE EACH ENTRY: 1 5
 9 17 19 21 24"
 234 FOR J=1 TO 7
```

```
236 INPUT A(J)
237 PRINT TAB 5;A(J)
238 NEXT J
239 CLS
240 PRINT "TYPE EACH ENTRY: 4 6
16 18 20 23 26"
242 FOR J=1 TO 7
244 INPUT B(J)
245 PRINT B(J)
246 NEXT J
248 CLS
250 PRINT "EXPENSE HEADINGS: BA
KED PRODUCE BEV GROC LIQUOR NONF
OOD CASUAL"
252 FOR J=1 TO 7
254 INPUT E$(J)
256 PRINT E$(J)
258 NEXT J
259 CLS
260 PRINT "SUPPLIERS"
262 FOR I=1 TO 6
264 PRINT E$(I)
266 FOR J=A(I) TO B(I)
268 INPUT S$(J)
270 PRINT S$(J)
272 NEXT J
274 NEXT I
276 CLS
284 INPUT S(J)
286 PRINT TAB 10;S(J)
288 LET E(I)=E(I)+S(J)
290 NEXT J
292 NEXT I
295 CLS
299 RETURN
300 REM DATA
301 PRINT "DATE"
302 INPUT B$
305 PRINT "LIST SALES"
310 FOR J=1 TO 5
315 PRINT R$(J)
316 INPUT R(J)
320 PRINT TAB 5;R(J)
321 PRINT "LIST OVERPUNCHES"
322 INPUT OP
323 LET R(J)=R(J)-OP
325 NEXT J
330 PRINT "LIST BILLS"
335 FOR J=1 TO 13
340 PRINT C$(J)
345 INPUT C(J)
350 PRINT TAB 5;C(J)
355 IF J=7 THEN PRINT "CARDS:"
360 NEXT J
365 PRINT "PETTY CASH"
366 INPUT CA
370 PRINT "LIST EXPENSES"
371 REM RESET EXPENSE TO 0
372 LET ET=0
373 FOR I=1 TO 6
375 PRINT E$(I)
380 FOR J=A(I) TO B(I)
382 PRINT S$(J)
384 INPUT S(J)
386 PRINT TAB 10;S(J)
390 NEXT J
391 CLS
392 NEXT I
399 RETURN
400 REM CASUAL
405 PRINT "NUMBER"
410 INPUT N
415 LET N=N+B(6)
420 LET E(7)=0
425 PRINT "NAMES"
430 FOR J=A(7) TO N
435 INPUT S$(J)
440 PRINT S$(J)
445 NEXT J
450 CLS
455 FOR J=A(7) TO N
460 PRINT S$(J)
465 INPUT S(J)
470 PRINT TAB 10;S(J)
475 LET E(7)=E(7)+S(J)
480 NEXT J
499 RETURN
500 REM CALCULATIONS
505 LET TC=0
506 FOR J=1 TO 7
507 LET TC=TC+C(J)
508 NEXT J
510 LET TCQ=0
511 FOR J=8 TO 13
512 LET TCQ=TCQ+C(J)
513 NEXT J
515 LET CT=TC+TCQ
520 LET R(7)=0
522 FOR J=1 TO 5
523 LET R(7)=R(7)+R(J)
525 NEXT J
530 FOR I=1 TO 6
532 LET E(I)=0
535 FOR J=A(I) TO B(I)
540 LET E(I)=E(I)+S(J)
542 NEXT J
545 NEXT I
550 LET ET=0
555 FOR I=1 TO 7
560 LET ET=ET+E(I)
565 NEXT I
580 LET NC=CT-CA
585 LET ST=NC+ET
586 LET OVER=ST-R(7)
587 LET SHORT=R(7)-ST
588 STOP
590 IF ST>R(7) THEN PRINT TAB 1
7;"[illegible]";TAB 25;OVER
595 IF ST<R(7) THEN PRINT TAB 1
7;"[illegible]";TAB 25;INT (100*SHORT+
0.05)/100
596 FOR Q=1 TO 150
597 NEXT Q
599 RETURN
600 REM LPRINT
601 CLS
605 PRINT "CASH";TAB 9;"1985";T
AB 17;"SALES";TAB 25;B$
610 PRINT "--------------------
----------"
615 FOR J=1 TO 7
616 PRINT C(J)/VAL C$(J);"X";C$
(J);TAB 9;C(J);TAB 17;R$(J);TAB
25;R(J)
617 NEXT J
620 PRINT TAB 2;T$;TAB 10;TC
621 PRINT
625 FOR J=8 TO 13
626 PRINT C$(J);TAB 9;C(J)
628 NEXT J
635 PRINT TAB 2;T$;TAB 10;TCQ
636 PRINT TAB 10;"------";TAB 1
7;CT
637 PRINT "PETTY CASH";TAB 17;C
A
```

```
 638 PRINT TAB 17;"------"
 639 PRINT "NET CASH";TAB 17;NC
 640 PRINT TAB 2;T$;" EXPENSES";
TAB 17;ET
 642 PRINT TAB 17;"------";TAB 2
5;ST
 644 PRINT TAB 25;"------"
 646 IF ST>R(7) THEN PRINT TAB 1
7;"[illegible]";TAB 25;OVER
 648 IF ST<R(7) THEN PRINT TAB 1
7;"[illegible]";TAB 25;INT (100*SHORT+
0.05)/100
 650 REM EXPENSE DETAIL
 655 FOR I=1 TO 7
 660 PRINT E$(I)
 665 LET B(7)=N
 670 FOR J=A(I) TO B(I)
 675 PRINT TAB 2;S$(J);TAB 10;S(
J)
 680 NEXT J
 685 PRINT TAB 17;E(I)
 690 NEXT I
 695 PRINT T$;"EXPENSES";TAB 17;
ET
 696 STOP
 697 INPUT A$
 698 IF A$="N" THEN GOTO 99
 699 RETURN
 700 LET TTC=TTC+NC
 710 LET TTE=TTE+ET
 720 FOR J=1 TO 7
 725 LET D(J)=D(J)+R(J)
 735 NEXT J
 740 FOR J=1 TO 7
 745 LET X(J)=X(J)+E(J)
 755 NEXT J
 790 PRINT "COMPLETED"
 799 RETURN
 800 LPRINT
 801 CLS
 802 PRINT "CUMULATIVE TOTALS TO
 DATE:";TAB 2;B$;"/85"
 805 PRINT
 810 PRINT "SALES"
 815 FOR J=1 TO 5
 820 PRINT TAB 2;R$(J);TAB 10;D(
J)
 825 NEXT J
 830 PRINT "TOTAL SALES";TAB 20;
D(7)
 835 PRINT
 840 PRINT "EXPENSES"
 845 FOR J=1 TO 7
 850 PRINT TAB 2;E$(J);TAB 10;X(
J)
 855 NEXT J
 865 PRINT "TOTAL EXPENSES";TAB
20;TTE
 870 PRINT
 875 PRINT "TOTAL CASH";TAB 20;T
TC
 880 PRINT "TOTAL SHORT= ";D(7)-
TTE-TTC
 899 RETURN
 910 LET CT=0
 915 LET ET=0
 920 FOR J=1 TO 7
 925 LET R(J)=0
 930 LET E(J)=0
 935 NEXT J
 940 RETURN
 950 LET TTC=0
 955 LET TTE=0
 990 GOSUB 170
 999 GOTO 30
1000 PRINT TAB 10;"OPTIONS"
1005 PRINT
1010 PRINT TAB 2;"1. SET UP VARI
ABLES"
1015 PRINT TAB 2;"2. DAILY INPUT
"
1020 PRINT TAB 2;"3. NEW MONTH"
1025 PRINT TAB 2;"4. END"
1030 PRINT TAB 2;"5. SAVE"
1035 PRINT TAB 2;"6. LIST"
1039 PRINT
1040 PRINT "LAST DAY ENTERED: ";
B$
1045 INPUT A
1046 CLS
1050 IF A=1 THEN GOTO 10
1055 IF A=2 THEN GOTO 30
1060 IF A=3 THEN GOTO 90
1065 IF A=4 THEN GOTO 98
1070 IF A=5 THEN PRINT "READY TO
 SAVE"
1073 IF A=6 THEN LIST
1075 PAUSE 150
1076 CLS
1080 PRINT "RELEASE PAUSE BUTTON
"
1085 PAUSE 120
1090 GOTO 2000
2000 SAVE "WI[illegible]"
2010 PRINT "COMPLETED"
2011 STOP
2014 GOSUB 900
2015 GOTO 1
8300 PRINT "TOTAL SALES";TAB 20;
D(7)
8400 PRINT
8500 PRINT TAB 2;E$(7);TAB 10;X(
7)
8600 PRINT
8650 PRINT "TOTAL EXPENSES";TAB
20;TTE
8750 PRINT "TOTAL CASH";TAB 20;T
TC
8800 RETURN
```